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Specific section. Techniques for determining ele-
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Appendixes

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2. Recommended wavelengths of spectral lines and
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2. Spectrophotometers--
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3. Flames--Applications
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SOME PROBLEMS IN THE THEORY OF THE
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61-20970

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II. Gorbunova, K. M.
III. Title: Oscillographic ...

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Office of Technical Services

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Conditions of Their Preparation, by Yu. M.
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The problem of the relationship between the magnitudes of the shift in the ion discharge potential of
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194923

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The Structure and Magnetic Characteristics of
Electrolytic Deposits of Ferromagnetic Metals and
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CIA/FDD XY-853

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Sci - Physics, Min/met
Sep 59

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The Phenomenon of the Formation of Electrode Zones During
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194906

During the deposition of copper-lead and nickel-cobalt alloys, changes in potential that are observed have a large period of fluctuation, within which fluctuations of smaller period occur. The large periods of change in cathode potential noted in oscillograms obtained during the deposition of nickel-cobalt and copper-lead alloys correspond to the time for the formation of one layer in the deposits. In order to ascertain the nature of the variations in potential in the process of deposition of an alloy which is accompanied by the evolution of hydrogen, oscillograms were obtained for the process of discharge of ions of hydrogen on copper and zinc from a cyanide solution, and it was shown that the cathode potential varies periodically during the discharge of the hydrogen ions. The fluctuations in potential with a short period during the deposition of alloys are due to the evolution of hydrogen. No substantial difference was found in the nature of the changes in cathode potential during the process of discharge of ions with the formation of an alloy that can be related to the different types of fusion diagrams. (Author) (See also 61-20960)

PB-

61-20970

The Structure and Magnetic Characteristics of
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61-20967

- I. Polukarov, Yu. M.
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Sci - Chem

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SOME PROBLEMS IN THE THEORY OF THE
ELECTRODEPOSITION OF ALLOYS. I. METHODS
OF CALCULATING THE SHIFT IN THE DISCHARGE
POTENTIAL OF IONS AT THE EXPENSE OF THE
DISPLACEMENT ENERGY DURING THE FORMATION
OF AN ALLOY. [1961] 7p. 30 refs.
Order from OTS or SLA \$1.10

61-20966

Trans. of Zhur[nal] Fiz[icheskoi] Khim[ii] (USSR)
1956, v. 30, no. 3, p. 515-521.
Another trans. is available from ATS \$13.45 as
ATS-76M44R [1960] 7p.

DESCRIPTORS: *Alloys, *Electrodeposition, Ions,
Motion.

The methods are discussed for calculating the shift in
the discharge potential of metallic ions taking place as
(Chemistry--Physical, TT, v. 7, no. 5) (over)

I. Polukarov, Yu. M.
II. Gorbunova, K. M.
III. Title: Methods ...

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a result of interaction of components during the formation of an alloy. The magnitude of the shift can be calculated directly from thermodynamic data, as well as from data on the free energy change obtained by measuring vapor pressure changes of the system, or from data on electromotive force of a suitably constructed circuit. The values of quantities of the energy of mixing of the components necessary for the calculations may be determined by the use of standard thermochemical methods, as well as from data obtained from experimentally constructed equilibrium diagrams using a method which is a reverse of that proposed in the literature for theoretical construction of diagrams from thermochemical data. Practical and convenient methods for changing from integral values of energy of mixing to differential values, which are necessary for evaluation of the processes taking place during the electrodeposition of an alloy on a cathode, are examined. (Author)

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61-20966

Polukarov, Yu. M. and Gorbunova, K. M.
SOME PROBLEMS IN THE THEORY OF THE
ELECTRODEPOSITION OF ALLOYS. II. AN IN-
VESTIGATION OF THE SHIFT IN THE DISCHARGE
POTENTIAL OF IONS DURING THE FORMATION
OF AN ALLOY. [1961] 7p. 8 refs.
Order from OTS or SLA \$1.10

61-20967

Trans. of Zhur[nal] Fiz[icheskoi] Khim[ii] (USSR)
1956, v. 30, no. 4, p. 871-877.
Another trans. is available from ATS \$13.65 as
ATS-77M44R [1960] 7p.

DESCRIPTORS: *Alloys, *Electrodeposition, Ions,
Motion.

It was established that the ennoblement (becoming
more positive) of the deposition potential (ΔE_{alloy})
of a metal during its entry into the alloy coincides
(Chemistry--Physical, TT, v. 7, no. 5) (over)

61-20967

I. Polukarov, Yu. M.
II. Gorbunova, K. M.
III. Title: Investigation. . .

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with the value calculated on the basis of data for the change in its partial thermodynamic potential. The possibility of using the data on the shift in deposition potentials for calculations in the reverse direction, i. e., for approximate computations of differential heats of solution of some unexplored systems is pointed out. An advantage of this method is the considerable simplification of the working procedure. The possibility of incorporating aluminum into the deposit during the deposition of nickel is demonstrated. (Author) (See also 61-20966)

PB-

61-20967

Polukarov, Yu. M. and Gorbunova, K. M.
SOME PROBLEMS IN THE THEORY OF THE ELEC-
TRODEPOSITION OF ALLOYS. III. CONDITIONS
FOR THE EQUALIZATION OF POTENTIALS OF
METAL SEPARATION AT THE EXPENSE OF EN-
ERGY LIBERATED DURING THE FORMATION OF
AN ALLOY. [1961] 4p. 2 refs.
Order from OTS or SLA \$1.10

61-20968

Trans. of Zhur[nal] Fizicheskoi Khim[i] (USSR)
1956, v. 30, no. 4, p. 878-881.
Another trans. is available from ATS \$8.00 as
ATS-78M44R [1960] 4p.

DESCRIPTORS: *Alloys, *Electrodeposition, Metals,
Separation, Energy, Metallurgical analysis.

The problem of the relationship between the magni-
tudes of the shift in the ion discharge potential of
(Chemistry--Physical, TT, v. 7, no. 3)

(over)

61-20968

I. Polukarov, Yu. M.
II. Gorbunova, K. M.
III. Title: Conditions . . .

194906

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metals at the expense of energy of interaction during alloying and the equalization of deposition potentials of metals is examined. It is shown that even in the presence of considerable energy of interaction and shift in the deposition potentials of metals toward the more positive side, potential equalization may not even be observed if the magnitudes of the shift for the two components are of the same order. On the basis of an investigation of the dependence of the change in the free energy of the system during the formation of an alloy on its composition it is shown that the energy of interaction may lead to equalization of deposition potentials of metals only up to a certain definite concentration of the electronegative metal in the alloy.
(Author) (See also 61-20967)

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61-20968

12 533

US-14

POLUKAROV Yu. M., GORBUNOVA K. M.

Some problems in the theory of the electrodeposition of alloys.
Part VI. The mechanism of formation of supersaturated solid
solutions and two-phase systems in the electrocrystallization
of alloys

Zhur. Fiz. Khim., 32, No. 4, 762-767 (1958)

RJ-2709. \$ 13.75 - English

E u r a t o m

12 532

US-14

POLUKAROV Yu. M., GORBUNOVA K. M.

Some problems in the theory of the electrodeposition of alloys.
Part V. Oscillographic investigation of the cathode potential in
the process of deposition of an alloy (the systems copper-zinc,
copper-lead, and nickel-cobalt)

Zhur. Fiz. Khim., 31, No. 12, 2682-2689 (1957)

RJ-2708. \$ 12.75 - English

E u r a t o m

61-10122
Polukarov, Yu. M.
INVESTIGATION OF THE STRUCTURE AND MAGNETIC CHARACTERISTICS OF ELECTRODEPOSITED FERROMAGNETIC METALS AND ALLOYS. I. NICKEL. [1960] 19p. 27 refs.
Order from LC or SLA ml\$2.40, ph\$3.30 61-10122

Trans. of Zhurnal Fizicheskoy Khimii (USSR) 1958, v. 32, no. 5, p. 1008-1015.
Other translations are available from ATS \$10.65 as
ATS-14M42R [1960] 9p. and from LC or SLA ml\$2.40, ph\$3.30 as 59-17256 [1959] 13p.

Experiments are described which showed that, due to the increase in stresses and strains of expansion in coatings, the coercive force of electrolytic nickel deposits increases when the pH of the electrolyte is increased. Under conditions where the pH considerably exceeds the value corresponding to the limit of the formation of the hydrate in the solution, a change is possible in the character of crystallization of the
(Chemistry--Physical, TT, v. 5, no. 4) (over)

- 61-10122
1. Nickel--Electrodeposition
2. Nickel--Magnetic properties
I. Polukarov, Yu. M.
II. Title: Nickel

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deposits. This leads to a sharp decrease in the value of coercive force. On the basis of a comparison of the structurally sensitive magnetic characteristics of nickel deposits obtained under different conditions, it was determined from the quantity of hydrogen included in such deposits that hydrogen is not the principal reason for internal stresses and strains observed in the deposits. The amount of hydrogen in nickel deposits depends upon its dispersity and the degree of distortion of the crystal lattice.

Pa-

61-10122

For the Development and Consolidation of
Veterinary Education by Correspondence, by V. M.
Koropov, F. S. Polukhin.

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Feb 1959, pp 11-13. CIA 9040588

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A Study of Deformation in Oblique Beam Roll
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RUSSIAN, per, Stal, No 12, 1960, pp 1108-1112.

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May 61

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A Study of Deformation in Oblique Beam Roll
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An Investigation of the Distribution of Metal
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Polukhin, V. T. Zhadan.

RUSSIAN, bk, Obrabotka Stali i Splavov Sbornik
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